

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

APPL. NO. : 10/060,121 CONFIRMATION NO.: 5887
APPLICANTS : ROBERT P. BENJEY
TITLE : METHOD AND SYSTEM FOR CONTROLLING LIQUID FUEL AND
VAPOR FLOW DURING REFUELING OF A MOTOR VEHICLE FUEL
TANK
FILED : January 31, 2002
ART UNIT : 3753
EXAMINER : JOHN A. RIVELL
CUSTOMER NO. : 00200

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF TRANSMISSION
(37 C.F.R. 1.8(a))

I, Alberta J. Fisher, hereby certify that this
correspondence is being faxed by facsimile
transmission to Art Unit 3573 at (703) 872-9306.

Alberta J. Fisher
Signature

Date: March 24, 2003

Sir:

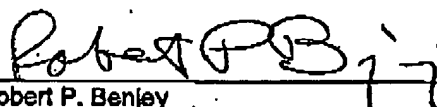
DECLARATION UNDER 37 CFR 1.132

Robert P. Benjey solemnly affirms and declares that:

1. He has been continuously employed by Eaton Corp. (Formerly G. T. Products) for 15 years as Chief Engineer at its Fuel Vapor Systems business located in Ann Arbor, Michigan. In this capacity his primary duties, included design and development of fuel vapor and refueling systems for motor vehicles. He holds a BS degree in Mechanical Engineering from the University of Michigan and has worked as a research and development engineer for 24 years following his graduation from the University of Michigan.
2. Declarant has reviewed patent 5769057 and the USPTO Office Action dated 12/24/03, including the Examiner's suggestion that adding a mechanical seal to the '057 patent in the present application is an obvious extension.
3. Declarant notes there is no mention in the '057 patent of a flexible or tight seal around Fillerneck N. The '057 patent text describes a vacuum being formed in the cup area 21 via the liquid seal activity between cup 3 and the O.D. of nozzle N. Due to normal manufacturing tolerances in the forming of the rigid cup there will be an annular clearance between nozzle N and the patent's claimed "seal" (which is not actually a tight seal) and some outside air will be entrained by the liquid seal pumping action (column 7, line 31-32). This flow of outside air around the nozzle is reduced by the recirculation of vapor from line 18 and is controlled by orifice 18b. The system in the '057 patent relies on a balance where the flow of recirculated vapor from line 18 must be limited or it will over-power the vapor absorption of the liquid seal pumping action. If this occurs, fuel vapor will escape around the so-called "seal" around the nozzle to atmosphere and cause the vehicle to fail federal emission requirements.

4. In order for the system of the '057 patent to function properly, orifice 18b must be small enough (e.g. sized) such that under conditions when hot fuel is dispensed into a cold tank, pressure in the fuel tank will not over power the liquid seal and thus requires a relatively small orifice in the recirculation line 18 (18b). The amount of recirculating fuel vapor is thus limited to meet federal emission regulations.
5. In the event a true "zero" leak mechanical seal were added to the system of the '057 patent as suggested by the Examiner, as shown in Benjey 5950865, this proposed modification would result in no atmospheric air available to feed the liquid seal pump; and, flow through orifice 18b could not make up the amount of vapor flow required to keep the refueling nozzle operating. The net result would be a premature nozzle shutoff and inability to fill the tank.
6. If the Examiner's proposed modification of the '057 patent were made, and such a system was operated in hot climate conditions where fuel at 110° F is dispensed into a substantially cooler tank, the addition of the mechanical seal would cause pressure to build in the cup area 21 which would close diaphragm 11a in valve 11d and a dangerous high-pressure condition would exist in the fuel tank, since the flow out of the fuel tank to the vapor storage canister would be closed while the nozzle continued to run. Subsequently, liquid would back up the filler pipe 3 and/or recirculation line 18 shutting off the nozzle; however, the fuel tank would not be full as desired and a severe over pressure condition could exist.
7. Furthermore in the event CARB Phase II or vapor vacuum nozzles that are in present use are employed in the system of the 5769057 patent, the vapor vacuum nozzle would draw air and vapor from area 21 in cup 3. Vapor not supplied by recirculation line 18 must be replaced by outside air flowing between nozzle N and the patent's referenced "seal" (orifice). If a real mechanical seal were added to the system of the '057 under these latter conditions, the nozzle would not have enough vapor flow available from recirculation line 18 to operate, no outside air would be available and the nozzle would fail to dispense fuel.
8. For the aforesaid reasons, adding a mechanical tight seal around nozzle N of the system of patent 5769057 as suggested by the Examiner would cause the system to fail under several publicly available operating modes.
9. Declarant that all statements herein made of his own knowledge are true and statements on information and belief are believed to be true; and, that willful false statements and the like are punishable by fine or imprisonment or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon.

Ann Arbor, Michigan
March 24, 2004


Robert P. Benjey